REMARKS

Applicant thanks the Examiner for the thoughtful review of the application. The status of the claims is as follows: **Claim 1, Claims** and **2 – 48** are **Pending** in the present application. **Claims 1, 6, 11, 24, 25, 33, 36,** and **44** have been **Amended** herein. **Claim 3** has been **Canceled** but is reintroduced herein as **Previously Presented Claim 46.** New **Claims 47** and **48** were added. Amendments to the claims are described below in the **PRESENT AMENDMENT.**

I. PRESENT AMENDMENT

Independent **Claims 1, 25, 33,** and **44** were amended herein to particularly point out and distinctly point out the subject matter the Applicant regards as the invention.

Specifically, those claims now recite that the memory array is "*re-writable*" and is positioned over active circuitry in the substrate, the active circuitry having multiple layers of conductive paths, and the active circuitry and the multiple layers of conductive paths are able to withstand high temperature processing at a high temperature. Claim 33 was further amended to recite layers that are stable a temperature of at least 450 °C. Support for the amendments can at least be found in **FIGS. 1A, 1B, 1C,** and **5** of the **Drawings** and Paragraphs **0019, 0019.1 – 0019.2, 0027 – 0028, 0037.1 – 0037.11,** and **0038 – 0043** of the **Detailed Description.**

Previously **Canceled Claim 3** was reintroduced as **Claim 46.** Support for the amendment can at least be found in **Claim 3** as originally filed.

Claims 6 and **36** were amended to include aluminum in addition to aluminum alloys. Support can at least be found in Paragraph **0043** of the **Detailed Description.**

Claim 11 was amended to provide a proper antecedent basis for "the memory cell" by inserting "formation of" and deleting "formation". Support for the amendment can at least be found in **Claim 1** as originally filed.

Claim 24 was also amended to correct grammar by changing "*2 arrays*" with "*two arrays*".

New **Claim 47** depends from **Claim 46** and recites at least two conductive metal oxide layers that are not identical to each other. Support for the amendment can at least be found in **FIG. 2D** of the **Drawings** and Paragraphs **0022.1 – 0022.7** and **0033** of the **Detailed Description**.

New **Claim 48** was added and recites that the memory cells in the memory array can include a non-ohmic device. Support for the amendment can at least be found in **FIG. 2c** and **FIG. 5** of the **Drawings** and Paragraphs **0022 – 0023, 0034 – 0035; 0037.06 – 0037.07**; and **0044** of the **Detailed Description**.

No new matter was introduced in amending the claims.

ii. ARGUMENT

a. Rejection of Claims 1- 4, 7 – 10, 25 & 28 under 35 U.S.C. §103(a) (the *247/821 references*)

Without commenting on the accuracy of the Examiner characterizing the conductive metal oxide layers as "at least two EPVR layers" or "EPVR first and second layers 404/406", the Applicant notes that the term EPVR does not appear in the Claims or the Specification of the present application and Applicant does not adopt or agree with the use of a term not disclosed in the present application.

The cited references U.S. Application **20040235247** and U.S. Patent **6,693,821** (*Hsu* hereinafter) taken individually or in combination do not disclose and do not render

prima facie obvious the elements recited in independent **Claim 1** as amended herein. Specifically, *Hsu* is silent and does not teach a memory array positioned over a substrate including active circuitry having multiple conductive paths, wherein the active circuitry and the multiple conductive paths are able to withstand high temperature processing at a first temperature. Although the cited sections of *Hsu* may discuss the suitability of various materials for electrodes, *Hsu* simply does not contemplate the possibility of building a cross point array directly over driver circuitry. If active circuitry shares the same footprint as the cross point array, the circuitry will be subjected to the same temperature profile as the memory itself. The Inventors recognition and solution to this issue led them to the present invention.

Accordingly, one skilled in the art upon reading *Hsu* would have no motivation to combine and/or modify the teachings of *Hsu* to arrive at the present invention as now claimed in **Claim 1**. Simply put, *Hsu* does not provide a road map that would lead one skilled in the art to combine its teachings and arrive at the present invention. Furthermore, all of the claim limitations of **Claim 1** are not taught or suggested by *Hsu*.

Consequently, independent **Claim 1** is not prima facie obvious in view of the cited sections of *Hsu* and the rejection of **Claim 1**under **35 U.S.C. §103(a)** ought to now be withdrawn. **Claims 2 – 24** and **Claims 46 - 48** depend from independent **Claim 1** and inherit all of its limitations. Therefore, for at least the same reasons as argued above for **Claim 1, Claims 2 – 24** and **Claims 46 - 48** are not prima facie obvious in view of the cited sections of *Hsu* and the rejection of **Claims 2 – 24** under **35 U.S.C. §103(a)** ought to now be withdrawn. For the same reasons as argued for dependent **Claims 2 – 24**, dependent **Claims 46 – 48** are not prima facie obvious in view of *Hsu*.

Similarly, **Claims 26 – 32** depend from independent **Claim 25** and inherit all of its limitations. Therefore, for at least the same reasons as argued above for **Claim 25, Claims 26 – 32** are not prima facie obvious in view of the cited sections of *Hsu* and the rejection of **Claims 26 – 32** under **35 U.S.C. §103(a)** ought to now be withdrawn.

b. **Rejection of Claims 5 – 6, 26 – 27, 33 – 37, 39 – 40, & 44 under 35 U.S.C. §103(a) (*247/821/617 references*)**

Independent **Claims 33** and **44** and dependent **Claims 33 – 37** and **39 – 40** are not prima facie obvious under **§103(a)** in view of the ***247/821/617*** references taken individually or in any combination for at least the same reasons as argued above for independent **Claims 1** and **25**. Moreover, dependent **Claims 5 – 6** and **26 – 27** which depend from independent **Claims 1** and **25** respectively, are also not prima facie obvious under **§103(a)** in view of the ***247/821/617*** references. First, neither of the *Hsu* references discloses all of the claim limitations as now recited in amended **Claims 1, 25, 33,** and **44**. Second, the reference U.S. Application **20030179617** (*Gudesen hereinafter*) is also silent, does not teach, and does not disclose all of the claim limitations as now recited in amended **Claims 1, 25, 33,** and **44**.

Finally, *Gudesen* disclose structures for reducing fatigue in memory device employing capacitance based ferroelectric cells having organic, polymeric electrets, or ferroelectrics based materials (see paragraphs 0004 – 0006). Accordingly, one skilled in the art upon reading the ***247/821/617*** references would not have a reasonable expectation of success in applying the combined teaching of *Hsu* with the capacitance based cell teachings of *Gudesen* and arrive at all the claim limitations set forth in **Claims 1, 25, 33,** and **44**.

The Examiner has explained *Gudesens'* low-processing-temperature electrodes are used "so as to minimize diffusion." However, the Examiner simply has not addressed the aspect of the present invention where completely different materials are used for top and bottom conductive array lines. Unlike electrodes, conductive array lines can be orders of magnitude longer than the memory element itself. Accordingly, conductive array lines can dramatically contribute to the overall electrical characteristics of the memory. The Inventors have realized that although bottom conductive array lines will be subjected to a high temperature profile, after the memory elements are formed, the top conductive array lines do not need to be exposed to similar temperatures. Accordingly, both high temperature and low temperature materials can be used, reducing overall resistance (and overall power requirements) of the memory array.

Consequently, **Claims 5 – 6, 26 – 27, 33 – 37, 39 – 40, and 44** are not prima facie obvious in view of the cited sections of the ***247/821/617*** references and the rejection of those claims under **35 U.S.C. §103(a)** ought to now be withdrawn.

c. **Rejection of Claims 11 – 23 & 29 - 33 under 35 U.S.C. §103(a) (*247/821/801 references*)**

For at least the same reasons as argued above for independent **Claims 1, 25, 33,** and **44, Claims 11 – 23** and **29 – 33** are not prima facie obvious in view of the ***247/821/801*** references taken individually or in any combination because all of the claim limitations in independent **Claims 1, 25, 33,** and **44** are not disclosed in the cited ***247/821/801*** references. Moreover, as for the U.S. Patent **6,544,801** reference (*Slaughter hereinafter*), the MRAM device and its MJT cells are co-fabricated in the same layer of the semiconductor substrate as the CMOS circuits that are used to access/control the MRAM device. Therefore, the cited sections of *Slaughter* are silent and teach away from fabricating a memory array over a substrate that includes active circuitry as is now recited in independent **Claims 1, 25, 33,** and **44.** Moreover, because the MRAM device/MJT cells are co-fabricated on the same substrate as the CMOS circuitry, there is no need and no motivation for separate high and low temperature processing profiles. Accordingly, one skilled in the art would not be motivated to combine/modify the teachings of the ***247/821/801*** references to arrive at the present invention.

Consequently, **Claims 11 – 23** and **29 – 33** are not prima facie obvious in view of the cited sections of the ***247/821/801*** references and the rejection of those claims under **35 U.S.C. §103(a)** ought to now be withdrawn.

d. **Rejection of Claims 38 & 41 – 42 under 35 U.S.C. §103(a) (*247/821/617/801 references*)**

Because **Claims 38** and **41 – 42** depended from amended independent **Claim 33** and inherit all of its limitations, those claims are not prima facie obvious in view of the ***247/821/617/801*** references taken individually or in any combination for at least the same reasons as argued above for **Claim 33**. Namely, all of the claim limitations as now recited in **Claim 33** are not taught or suggested by any combination of the ***247/821/617/801*** references. Accordingly, **Claims 38** and **41 – 42** are not prima facie obvious in view of the cited sections of the ***247/821/617/801*** references and the rejection of those claims under **35 U.S.C. §103(a)** ought to now be withdrawn.

e. **Rejection of Claim 24 under 35 U.S.C. §103(a) (*247/821/882 references*)**

For at least the same reasons as argued above for independent **Claim 1**, dependent **Claim 24** is not prima facie obvious in view of the ***247/821/882*** references taken individually or in any combination because all of the claim limitations in **Claim 1** are not taught, suggested, or disclosed in the cited ***247/821/882*** references. Moreover, the one-time programmable anti-fuse based memory cell of the U.S. Patent **6,034,882** reference (*Johnson hereinafter*) teaches away from the readable/writeable/re-writable non-volatile resistance based memory cell of the present invention because the anti-fuse based memory cell of *Johnson* cannot store a different value of data once it has been programmed (i.e. the fuse is blown). In sharp contrast, data stored in the readable/writeable/re-writable non-volatile resistance based memory cell of the present invention can be over written with new data by applying the appropriate voltage pulses. Therefore, *Johnson* discloses a write-once, one-time-programmable, and a non-analogous art that would not lead one skilled in the art to arrive at the re-writeable memory of the present invention. Consequently, **Claim 24** is not prima facie obvious in view of the cited sections of the ***247/821/882*** references and the rejection of **Claim 24** under **35 U.S.C. §103(a)** ought to now be withdrawn.

f. **Rejection of Claim 43 under 35 U.S.C. §103(a) (*247/821/627/944 references*)**

For at least the same reasons argued above for independent **Claim 33**, dependent **Claim 43** is not prima facie obvious in view of the cited sections of the ***247/821/627/944*** references taken individually or in any combination because all of the claim limitations of independent **Claim 33** are not taught or suggested by those references. Additionally, the non-ohmic device as disclosed by the U.S. Patent **6,331,944** reference (*Monsma hereinafter*) does not render **Claim 43 §103(a)** obvious because one skilled in the art upon reading *Monsma* and the remaining ***247/821/627*** references would not be placed in possession of all of the claim limitations recited in independent **Claim 33**. Therefore, **Claim 43** is not prima facie obvious in view of the cited sections of the ***247/821/627/944*** references and the rejection of **Claim 43** under **35 U.S.C. §103(a)** ought to now be withdrawn.

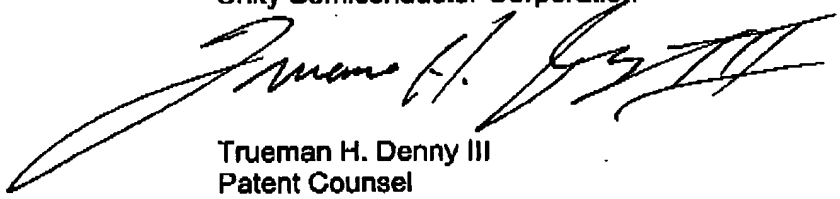
g. **Rejection of Claim 45 under 35 U.S.C. §103(a) (*247/821/882/617 references*)**

For at least the same reasons argued above for independent **Claim 1**, dependent **Claim 45** is not prima facie obvious in view of the cited sections of the ***247/821/882/617*** references taken individually or in any combination because all of the claim limitations of independent **Claim 1** are not taught or suggested by those references. One skilled in the art upon reading the cited references would not be placed in possession of all of the claims limitations set forth in **Claim 1** from which **Claim 45** ultimately depends. The problem of temperature driven diffusion in the ferroelectric device of *Gudesen* would not lead one skilled in the art to conclude that a non-refractory a top metal layer would be required for the memory array of the present invention because the memory cells are already formed at a high temperature. Therefore, **Claim 45** is not prima facie obvious in view of the cited sections of the ***247/821/882/617*** references and the rejection of **Claim 45** under **35 U.S.C. §103(a)** ought to now be withdrawn.

iii. CONCLUSION

Applicant now believes the present case to be in condition for allowance, and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application the undersigned can be reached at (408) 737-7200 x124.

Respectfully submitted,
Unity Semiconductor Corporation



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